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## THE PROBLEMS OF THE UNITY OR PLURALITY AND THE PROBABLE PLACE OF ORIGIN OF THE AMERICAN ABORIGINES<sup>1</sup>

### INTRODUCTORY REMARKS

BY J. WALTER FEWKES, PRESIDENT OF THE AMERICAN  
ANTHROPOLOGICAL ASSOCIATION

OUR session this afternoon will be devoted to a consideration of the unity or plurality of the aboriginal American race and the probable place of its origin. It will practically take the form of a discussion, the various aspects of the subject being presented by those who have given it special attention. In opening this discussion I shall simply make a few suggestions and emphasize a few salient points, some of which others, better able than myself to present an authoritative treatment, may deem worthy of elaboration.

Far from being a novel one in the sessions of this Association, some aspect of the question of the origin of the American race has come to be almost perennial, and it acquires greater interest as increase in our knowledge of the subject offers new points of approach. At what epoch man came to our continent from a former home; how he made his way hither; and his history since he came, are questions that possess greater and greater attraction as the science of man becomes broader and deeper. While the majority

<sup>1</sup> Discussion at a joint session of the American Anthropological Association and Section H of the American Association for the Advancement of Science held at the U. S. National Museum, Washington, December 27, 1911.

of anthropologists hold that man's original home was in Eurasia, there are those who advance reasons which in their judgment are equally adequate to prove that he was autochthonous in America, whence he spread to the Old World. Some students have held that America was peopled from the Old World because conditions of life were more complex on that continent than in the New, and because the simians most closely allied anatomically to man are indigenous to the Eastern Hemisphere. As none of the higher apes occur in America, it is reasoned that man, who is regarded as related to these animals, could not have been evolved in America. If we accept the theory that man originated in the Old World, it is evident that his colonization of America is a question of mode of migration, which resolves itself into a geographical or a geological one. An adequate solution of our problem must draw contributions from several sciences—geology, geography, comparative anatomy, and culture history. The distribution of animal or food plants, the direction of ocean currents and winds, the changes in continental masses—all must be considered.

Necessarily the subject of our proposed discussion centers about that of the antiquity of man in America. When did man come to this continent? Was it in a late geological epoch, making him contemporaneous with animals now extinct like the giant sloths, mammoths, and mastodons; or was it later? It can readily be seen that the question becomes a paleontological one, and so far as the determination of the age of the strata in which the anthropologist finds human remains is concerned, a purely geological problem. Unless we are prepared to accept an autochthonous origin of man or his evolution from higher animals in America, the means of primitive migration available, and the conditions of culture implied by a sea voyage, must not be overlooked. It is evident that the situation of islands, the configuration of land, and changes in its contour, are directly connected with all theories of the peopling of America. Both the course and velocity of ocean currents, and the distribution and quantity of food supplies and fresh water, must be considered in this problem, which draws from so many sources for its solution.

It is important, in this discussion, to consider the physical and cultural condition of the first men that landed in America. Were they low in the scale, scarcely raised above their nearest animal relatives, or did they bring with them well-developed arts? For an answer to these questions, so far as ancestry is concerned, we must consult the physical anthropologist and the archeologist. Whence arose all this great complexity of tongues, rivaling in number those of Babel? Are the present linguistic stocks due to consolidation of a still greater number, or were they derived from one ancestral form? Are there any essential lexical or grammatical relationships between the languages of the Old World and the New, and if so, what do their resemblances mean? The philologist may shed light on these questions. The observer finds evidences of many arts, symbols, ceremonies, and mythologies, comparable or identical with those of the Old World, which existed in prehistoric America. For the interpretation of these similarities we naturally turn to the ethnologist. They have been interpreted by some students as derivative, by others as due to independent origin. It is self-evident that they have a significant bearing on the subject we are to discuss.

At one time the Indians of our continent were regarded as rude savages, but the discovery of magnificent temples in Mexico and Central America, and the evidences of high culture, with advanced sociological conditions, in the lofty plateaus of South America, show that in dealing with the American race we are considering a people that in some places reached a high stage of development. The geographical limitations of the higher culture of aboriginal man in America also have a bearing on our discussion. A determination of the unity or plurality of type in the American race would appear to be fundamental, and one upon which rests the whole fabric of physical and cultural variation in different parts of the American continent. Many physical anthropologists have held that throughout the length of our continent, through all degrees of climate, from the frigid to the torrid zone, the American race is practically of one type. It is supposed that the ancestors of this race must have lived for ages in one environment which stamped upon it a common feature that could not be

eradicated by such great climatic differences. Where that ancestral home was, has not yet been made known, and if it could be determined an important step would be taken in the solution of our problem.

In their ultimate analysis ethnology and archeology are departments of history in its broadest significance; they belong to culture history, not recorded in writings, although traced by other equally decisive evidence. The discovery of America by Columbus was one of the most important and far-reaching events in human history, but it was not the original discovery of the American continent. Centuries before the great Genoese, man had developed a characteristic culture upon its soil. Most of the evidence for the antecedent discovery of America is archeological, and we designate the epoch prehistoric, but all this belongs to the evolution of culture and may therefore be called culture history. The discussion of the archeological evidence of the discovery of America by man prior to Columbus is facilitated by determining to which of the races of the Old World he is most closely allied.

The laws governing the dispersion of animals and plants may well be considered in the discussion of the peopling of the American continent. So far as man is regarded as an animal he is subservient, especially in his primitive condition, to the same laws of geographical dispersion that are so potent in the distribution of faunas and floras. But in all considerations of more cultivated man, his place of origin and dispersion over the earth's surface, the psychic element should not be overlooked, for while he shares with animals certain mental characters, his migration on the earth is due primarily to the greater development of his mind. In some physical features he may be called weak and helpless in a struggle for supremacy, but no animal equals him in relative cranial capacity, and he outranks all in mental power. His mind, not his body, has conquered the world, and the use of that mind makes it possible for him to adapt himself to all climates and environments. The development of ideas, or culture history and its modifications by surroundings, is closely allied to our subject.

## HISTORICAL NOTES

By ALEŠ HRDLIČKA

The program calls first for a presentation of the historical side of the subject, or, strictly speaking, for a brief history of the opinions that have been held on the question of the nature and origin of the American natives since their discovery. This history, it may be said at the outset, is largely one of speculation, fettered on one side by ignorance and on the other by ancient traditions.

When Columbus discovered the New World he and his companions imagined, as is well known, that they had reached India, and the people met were naturally taken for natives of India. Later, as the true nature of the new land became better known, speculations concerning the newly discovered race took other directions, and some of the notions developed proved disastrous to the Indians. History tells us that many of the early Spaniards, up to Las Casas' time, reached the conclusion that, as no mention was made concerning the American people in Hebrew traditions, they could not strictly be regarded as men, equivalent to those named in biblical accounts, and this view, which eventually had to be counteracted by a special papal bull, led directly or indirectly to wholesale enslavement and destruction of the Americans.

One of the effects of this papal edict was that thenceforth the origin of the Indians was sought in other parts of the world, and the seeming necessity of harmonizing this origin with biblical knowledge led eventually to several curious opinions. One of these, held by Gomara, Leriis, and Lescarbot, was to the effect that the American aborigines were the descendants of the Canaanites who were expelled from their original abode by Joshua; another, held especially by McIntosh,<sup>1</sup> was that they were descended from Asiatics who themselves originated from Magog, the second son of Japhet; but the most widespread theory, and one with the remnants of which we meet to this day, was that the American Indians represented the so-called Lost Tribes of Israel.<sup>2</sup>

During the course of the 19th century, with Levèque, Hum-

<sup>1</sup> McIntosh, J., *Origin of the North American Indians*, New York, 1843.

<sup>2</sup> Adair, J., *History of the North American Indians*, London, 1775.

boldt.<sup>1</sup> McCulloch,<sup>2</sup> Morton,<sup>3</sup> and especially Quatrefages,<sup>4</sup> we begin to encounter more rational hypotheses concerning the Indians, although by no means a single opinion. Lord Kaimes, Morton, and Nott and Gliddon<sup>5</sup> professed the belief that the American natives originated in the New World and hence were truly autochthonous; Grotius believed that Yucatan had been peopled by early Christian Ethiopians; according to Mitchell the ancestors of the Indians came to this country partly from the Pacific ocean and partly from northeastern Asia; the erudite Dr McCulloch believed that the Indians originated from parts of different peoples who reached America over lost land from the west "when the surface of the earth allowed a free transit for quadrupeds"; Quatrefages viewed the Americans as a conglomerate people, resulting from the fossil race of Lagoa Santa, the race of Paraná, and probably others, in addition to which he believed there had been settlements of Polynesians; and according to Pickering the Indians originated partly from the Mongolian and partly from the Malay.

The majority of the authors of the last century, however, including Humboldt, Brerewood, Bell, Swinton, Jefferson, Latham, Quatrefages, and Peschel,<sup>6</sup> inclined to the belief that all the American natives, excepting the Eskimo, were of one and the same race and that they were the descendants of immigrants from northeastern Asia, particularly from the "Tartars" or Mongolians.

The most recent writers, with one marked exception, agree entirely that this country was peopled through immigration and local multiplication of people; but the locality, nature, and time of the immigration are still much mooted questions. Some authors incline to the exclusively northeastern Asiatic origin; others, such as ten Kate and Rivet, show a tendency to follow Quatrefages in

<sup>1</sup> Humboldt, *Political Essay*, I, 115; Humboldt and Bonpland, *Voyage des Cordilleras*, Paris, 1810.

<sup>2</sup> McCulloch, *Researches, Philosophical and Antiquarian, Concerning the Aboriginal History of America*, Baltimore, 1829.

<sup>3</sup> Morton, S. G., *Distinctive Characteristics of the Aboriginal Race of America*, 2d ed., pp. 35-36, Philadelphia, 1844. (Also his *Crania Americana*, and *Origin of the Human Species*.)

<sup>4</sup> Quatrefages, *Histoire générale des races humaines*, Paris, 1887.

<sup>5</sup> Nott and Gliddon, *Types of Mankind, and Indigenous Races*. (The latter includes statements by Leidy and Morton.)

<sup>6</sup> Peschel, O., *The Races of Man*, p. 418, 1876.

attributing at least some parts of the native American population to the Polynesians; Brinton<sup>1</sup> held that they came in ancient times over a land connection from Europe; and Kollmann,<sup>2</sup> basing his belief on some small crania, believes that a dwarf race preceded the Indian in America.

A remarkable hypothesis concerning the origin of the American native population, deserving a few words apart, has within the last thirty years, and especially since the beginning of this century, been built up by Ameghino,<sup>3</sup> the South American paleontologist. This hypothesis is, in brief, that man, not merely the American race, but mankind, originated in South America; that man became differentiated in the southern continent into a number of species, most of which are now extinct; that from South America he migrated over ancient land connections to Africa, and from there peopled all the Old World; that a strain from the remaining portion multiplied and spread over South America; and that eventually, somewhere in relatively recent times, a portion of that branch which peopled Africa and then Asia, migrated, by the northern route, into North America. In part this theory is also favored by Sergi.

In addition there have been some suggestions that the Americans may have arrived from the "lost Atlantis"; and the theory has even been expressed that man, instead of migrating from north-eastern Asia into America, may have moved in the opposite direction, and especially that, after peopling this continent, a part of the Americans reached Siberia.<sup>4</sup>

The Eskimo have been generally considered as apart from the

<sup>1</sup> Brinton, D. G., *The American Race*, New York, 1891.

<sup>2</sup> Kollmann, J., *Die Pygmäen* (Verh. d. Naturforsch. Ges. Basel, xvi, Basel, 1902).

<sup>3</sup> Ameghino, F., *El Tetraprothomo Argentinus* (Anal. Mus. Nac., xvi, Buenos Aires, 1907); also *Le Diprothomo platensis* (*ibid.*, xix, 1909).

<sup>4</sup> In this connection see also Campbell, J., *Asiatic Tribes in N. America*, *Proc. Canadian Inst.*, n. s., 1, Toronto, 1881; Mason, O. T., *Migration and the Food Quest: A Study in the Peopling of America*, *Smithson. Rep. for 1894*, Wash., 1896, pp. 523-540; Morse, E. S., *Was Middle America Peopled from Asia?* *Popular Sci. Mo.*, Nov., 1898; Powell, J. W., *Whence Came the American Indians?* *Forum*, Feb., 1898; *Major Powell's Inquiry: Whence Came the American Indians? An Answer*, by J. Wickersham, Tacoma, Wash., 1899, pp. 1-28; Hallock, Chas., *The Ancestors of the American Indigenes*, *Amer. Antiquarian*, xxiv, no. 1, 1902, and the publications of the Jesup Expedition of the American Museum of Natural History, New York.

Indian, some holding that they preceded and others that they followed him. They have been connected generally with the north-eastern Asiatics, but there are also those who see a close original relation between the Eskimo and the Lapps, and even between the Eskimo and the paleolithic Europeans.

These are, in brief, the various more or less speculative opinions that so far have been advanced in an effort to explain the ethnic identity and the place of origin of the American Indian; and it is only logical that the next word on these problems be given to physical anthropology, which deals with what are, on the whole, the least mutable parts of man, namely, his body and skeleton.

#### THE BEARING OF PHYSICAL ANTHROPOLOGY ON THE PROBLEMS UNDER CONSIDERATION

By ALEŠ HRDLIČKA

The somatology of the Indians, which barely saw its beginnings in the time of Humboldt and Morton, has now advanced to such a degree that at least some important generalizations concerning the American aborigines are possible. We have now at our disposal for comparison, in American museums alone, upward of twenty thousand Indian crania and skeletons from all parts of the continent, while several thousand similar specimens are contained in European collections. A considerable advance, particularly in North America, has also been made in studying the living natives. Unfortunately we are much less advantageously situated in regard to comparative skeletal material as well as with respect to data on the living from other parts of the world, particularly from those parts where other indications lead us to look for the origin of the Indian.

What can be stated in the light of present knowledge concerning the American native with a fair degree of positiveness is that, first, there is no acceptable evidence, or any probability, that man originated on this continent; second, that man did not reach America until after attaining a development superior to that of even the latest Pleistocene man in Europe, and after having undergone advanced and thorough stem and even racial and tribal differentiation; and third, that while man, since the peopling of

this continent was commenced, has developed numerous secondary, subracial, localized structural modifications, these modifications can not yet be regarded as fixed, and in no important feature have they obliterated the old type or types of the people.

We are further in a position to state that, notwithstanding the various secondary physical modifications referred to, the American natives, barring the more distantly related Eskimo, present throughout the Western Hemisphere numerous important features in common, which mark them plainly as parts of one stem of humanity. These features are:

1. The color of the skin. The color of the Indian differs, according to localities, from dusky yellowish-white to that of solid chocolate, but the prevailing color is brown.

2. The hair of the Indian, as a rule, is black and straight; the beard is scanty, especially on the sides of the face, and it is never long. There is no hair on the body except in the axillæ and on the pubis, and even there it is sparse.

3. The Indian is generally free from characteristic odor. His heart-beat is slow. His mental characteristics are much alike. The size of the head and of the brain cavity is comparable throughout, averaging somewhat less than that of white men and women of similar stature.

4. The eyes as a rule are more or less dark brown in color, with dirty yellowish conjunctiva, and the eye-slits show a prevailing tendency, more or less noticeable in different tribes, to a slight upward slant, that is, the external canthi are frequently more or less higher than the internal.

5. The nasal bridge, at least in men, is throughout well developed, and the nose in the living, as well as the nasal aperture in the skull (barring individual and a few localized exceptions), show medium or mesorhinic relative proportions. The malar regions are as a rule rather large or prominent.

6. The mouth is generally fairly large, the lips average from medium to slightly fuller than in whites, and the lower facial region shows throughout a medium degree of prognathism, standing, like the relative proportions of the nose, about midway between those

found in whites and negroes. The chin is well developed. The teeth are of medium size, when compared with those of mankind in general, but perceptibly larger when contrasted with those of the white American; and the upper incisors are characteristically shovel-shaped, that is, deeply and peculiarly concave on the buccal side. The ears are large.

7. The neck, as a rule, is of only moderate length, and is never very thin; the chest is somewhat deeper than in average whites; the breasts of the women are of medium size and generally more or less conical in form. There is a complete absence of steatopyggy; the lower limbs are less shapely and especially less full than in whites; the calf is small.

8. The hands and feet, as a rule, are of relatively moderate or even of small dimensions, and what is among the most important of all the characteristics, the relative proportions of the forearms to arms and those of the distal parts of the lower limbs to the proximal (or, in the skeleton, the radio-humeral and tibio-femoral indices), are in general, throughout the two parts of the continent, of much the same average value, which differs from that of both the whites and the negroes, standing again in an intermediary position.

This list of characteristics which are, generally speaking, shared by all American natives, could readily be extended, but the common features mentioned ought to be sufficient to make clear the fundamental unity of the Indians.

The question that necessarily follows is, "Which, among the different peoples of the globe, does the Indian, as here characterized, most resemble?" The answer, notwithstanding our imperfect knowledge, can be given conclusively. There is a great stem of humanity which embraces people ranging from yellowish white to dark brown in color, with straight black hair, scanty beard, hairless body, brown and often more or less slanting eye, mesorhinic nose, medium prognathism, and in every other essential feature much like the American native; and this stem, embracing several races or types and many nationalities and tribes, occupies the eastern half of the Asiatic continent and a large part of Polynesia.

From the physical anthropologist's point of view everything

indicates that the origin of the American Indian is to be sought among the yellowish-brown peoples mentioned. There are no two large branches of humanity on the globe that show closer fundamental physical relations.

But difficulties arise when we endeavor to assign the origin of the Indian to some particular branch of the yellowish-brown population. We find that he stands quite as closely related to some of the Malaysian peoples as to the Tibetans, the Upper Yenisei natives, and some of the northeastern Asiatics. It is doubtless this fact that accounts for some of the hypotheses concerning the origin of the Indian that attribute his derivation partly to the "Tartars" and partly to the Polynesians.

All that may be said on this occasion is that the circumstances point strongly to a coming, not strictly a migration, over land, ice, water, or by all these media combined, from northeastern Asia, of relatively small parties, and to comings repeated probably nearly to the beginning of the historic period.

As to Polynesian migrations within the Pacific, such were, so far as can be determined, all relatively recent, having taken place when America doubtless had already a large population and had developed several native cultures. It is, however, probable that after spreading over the islands, small parties of Polynesians may have accidentally reached America; if so, they may have modified in some respects the native culture, but physically, being radically like the people who received them (barring their probably more recent negro mixture), they would readily blend with the Indian and their progeny could not be distinguished.

The conclusions, therefore, are that the American natives represent in the main a single stem or strain of people, one *homotype*; that this stem is the same as that of the yellow-brown races of Asia and Polynesia; and that the main immigration of the Americans has taken place gradually by the northwestern route, in the Holocene period, and after man had reached a relatively high stage of development and multiple racial differentiation. The immigration, in all probability, was a dribbling and prolonged overflow, likely due to pressure from behind and a search for better hunting and

fishing grounds. This was followed by rapid multiplication, spread, and numerous minor differentiations of the people on the new, vast, and environmentally highly varied continent. It is also probable that the western coast of America, within the last two thousand years, was on more than one occasion reached by small parties of Polynesians, and that the eastern coast was similarly reached by small groups of whites; but these accretions have not modified greatly, if at all, the mass of the native population.

ON THE GEOLOGICAL ASPECTS OF THE POSSIBLE HUMAN IMMIGRATION  
BETWEEN ASIA AND AMERICA

BY WILLIAM H. DALL

The assumption is generally made that migration by prehistoric man between the continents of Asia and America was predominantly (if not exclusively) by way of the northeastern extreme of the one and the northwestern extreme of the other body of land.

This idea being taken as a starting point for consideration of the question that has been assigned to me in this discussion, it devolves upon us to consider the local conditions under which migration might have taken place.

To the eye of one unfamiliar with the Bering sea region, and judging solely by the appearance of ordinary maps, it would appear obvious that the long chain of the Aleutian islands together with the Alaska peninsula forms a most convenient series of stepping stones from Kamchatka to America, which, given a certain amount of elevation above its present level, might almost form a complete land bridge between the two continents. Such assumptions have frequently been made in discussing the peopling of America in prehistoric times.

How unfounded are these ideas will presently be shown.

Bering sea, taken in a broad sense, may be divided into two characteristic areas, by a line obliquely drawn from the southeastern extreme of the Chukchi peninsula to the Alaska peninsula, curving sufficiently to the southwest to include all the islands situated in the midst of the sea, St Lawrence, St Mathew, the Pribilof islands, and their associated islets.

To the northeast of this line the sea is shallow, averaging less than fifty fathoms, and over a large part of the area less than thirty fathoms. To the southwest of the line the continental shelf falls abruptly to oceanic depths of 1000 to 2000 fathoms or little less. While the mud brought down by the Yukon, Kuskokwim, and other large American rivers undoubtedly contributes somewhat to the shoaling of Bering sea, especially near the deltas, the great submarine plateau is not an accumulation of mud, but a submerged portion of the continent, composed, at least to some extent, of Miocene and Pliocene fossiliferous rocks, masses of which, containing fossils, have been brought up, entangled in the eruptive rocks, of which the islands previously mentioned are formed. This is notably the case on the island of St Paul,<sup>1</sup> and the same rocks with the same fossils come to the surface in the vicinity of Nushagak on the continent to the eastward.

The deep water of the western and southern portion of Bering sea extends northward to the Chukchi peninsula on the Asiatic side of Bering strait, heading in the deep bight known as Plover bay; and on the south extends, roughly parallel with the Kurile islands, to northern Japan.

The sea on either side of the Aleutian chain, and frequently between the groups into which the chain is divided, is extremely deep, 800 fathoms or more being had in some places within a mile or two of the shore, and 1000 to 2000 fathoms within a relatively short distance farther seaward.

These islands mark a line of weakness in the earth's crust, from which have emerged granitic and porphyritic eruptive rocks, against which have been deposited Eocene, Oligocene, and Miocene sedimentary strata, subsequently invaded by basaltic eruptives, which are still occasionally thrust forth.

Between the westernmost islands of the Aleutian chain and the continent of Asia lies a stretch of sea some 350 miles in width, and now one of the foggiest, roughest, and most continuously tempestuous seas in the world. Through this stretch pours the Arctic

<sup>1</sup> A list of these fossils is given in the *U. S. Report on the Fur Seals and Fur Seal Islands of the North Pacific Ocean*, part III, 1899, pp. 544-545.

current in a southwesterly direction with a rate of nearly a mile an hour to the southward in quiet weather. It is true that the Commander islands lie a little to the northward in this gap, but no relics of habitation by man previous to Bering's voyage have been found on them, and the discovery of the sea-cow there, which had previously been exterminated for use as food wherever man is known to have been, is good evidence that primitive man had never invaded the last refuge of that now extinct species.

We must suppose that man on first arriving in America was in a low stage of culture, and, while perhaps possessed of rude canoes, would not have had means of navigating a stormy sea, 350 miles wide, without compass, starguides,<sup>1</sup> or landmark, and across a current that would have swept him far to the southward of the Aleutians before he could possibly have reached in canoes the most westerly members of the group.

My conclusion is that migration from Asia to America by the Aleutian chain was absolutely impossible to primitive man, and that this route must be discarded entirely from our hypotheses.

I may add here that the legends, geographical names, and language, as well as the typically Eskimo culture, of the Aleuts, all point to their invasion of the Archipelago from the eastward, as the result of tribal wars, and before they had developed their specialized culture to the point it finally attained.<sup>2</sup>

The next region to be considered is that about Bering strait.

Here we have shallow water, not exceeding 200 feet in depth anywhere between the continents at the strait, and to reach a point where the sea is seventy-five fathoms deep one must go several hundred miles northward.

The so-called Seward or Kaviak peninsula reaches out toward Asia from the American continental mass, and only about fifty miles away, on the Asiatic eastern extreme rises East Cape to a commanding height. Midway of the strait are the small but inhabited islands called the Diomedes.

<sup>1</sup> The stars are not visible in this latitude except in winter, and if visible would be concealed by the perpetual fog.

<sup>2</sup> See: Dall, Origin of the Innuit, *Contr. to N. Am. Ethnology*, vol. 1, pp. 93-98, 1877; Remains of Later Prehistoric Man, etc., *Smithsonian Contr. to Knowledge*, no. 318, 1878.

The geology of the American peninsula differs curiously from that of the Chukchi peninsula on the opposite side of the strait. It comprises a complex of rocks, schistose and slaty to a large extent, from which the gold placers have been derived.

It is margined by elevated beaches of Pliocene and Pleistocene age, in which the first discovery of gold was made, and which indicate a gradual rise of the land from Pliocene to the recent Quaternary time. At no time when we might suppose primitive man to have invaded America is there evidence that the land of the peninsula and the region of the strait were higher than at present. On the contrary, in the Pliocene at least we have unmistakable evidence that not only was the land lower and the climate somewhat milder (approximating that of the Aleutian region of today) but that the communication between the North Atlantic and North Pacific waters was more open than today. As evidence of this I may cite the fact that, while the type of *Littorina* of which *L. obtusata* L. and *L. palliata* Say are characteristic is not now known from anywhere west of the Atlantic coast of America, a fine species of this sort is found in the Pliocene of Nome, Alaska; and in the Pliocene of Sankoty Head, Nantucket, Mass., are two species of bivalves no longer living in the Atlantic, but found both fossil in the Nome Pliocene and living in the waters of Bering sea.

With the coming of the Glacial epoch a lowering of temperature took place in this region which has, with various fluctuations, continued practically to the present time, attended, after the melting of the glaciers, by a gradual and very moderate elevation of the land which is believed to be still in progress. Very recent indications of it have been observed in the vicinity of St Michael on Norton sound.

On the opposite side of Bering strait the geological character is quite different. The Diomede islands in the strait are granitic domes of massive eruption. The high land of the Chukchi peninsula is largely of the same character, the rock forms having been modified to some extent by small local glaciers and the disintegrating influence of very low winter temperatures. There is no trace of the gold-bearing series of schistose rocks to which the metallic riches of

Alaska are due, the utmost endeavors of Russian and American explorers and prospectors having revealed no indications of gold in commercial quantities. It is only some hundred and thirty miles westward from Bering strait that sedimentary rocks are reported. Moreover, it is well known that the vast boreal tundras of the North Siberian coast have but recently (in a geological sense) emerged from the sea; the bones of whales now existing on the surface in places many miles from the coast of the Polar sea.

It is an historical fact that the present group of Asiatic Eskimo (not the Chukchi) are migrants from America, driven by tribal wars not many centuries ago, and that at one time their colonies extended much farther west and south than at the present time.<sup>1</sup>

For the discontinuity of the land at Bering strait (the region to the north of the strait being excluded from the discussion) during and after the Glacial epoch, there is evidence of a certain weight in the distribution of the fauna. In the matter of the mollusca, if the land had been continuous then we should expect to find the same marine fauna on both sides of the strait now.

Excluding species belonging to the circumpolar fauna, strictly speaking, and which largely date back to the Miocene; and the few forms that have crept from the South Pacific abyssal waters north to Bering sea and its cold shallows, we find the unexpected fact that the fauna of the Asiatic coast and that of the American coast

<sup>1</sup> For the historical data and other information about the Innuit of Asia and the Diomedes, see the following sources:

Gerhard Friedrich Müller, *Voyages from Asia to America*; translated by Thos. Jeffreys; second ed., 1764, pp. 25-27.

W. H. Dall, *Alaska and Its Resources*, Boston, Lee and Shepard, 1870, pp. 375-6.  
\_\_\_\_\_, *Contributions to N. Am. Ethnology* (Powell Survey), I, 1877, pp. 13-14, 93-106.

\_\_\_\_\_, Remains of Later Prehistoric Man, etc., *Smithsonian Contr. to Knowledge*, no. 318, 1878.

\_\_\_\_\_, *Proc. Royal Geographical Society*, III, no. 9, Sept., 1881, pp. 568-70.  
\_\_\_\_\_, Chukchee and Namollo People, *American Naturalist*, Nov., 1881, pp. 857-868.

\_\_\_\_\_, *U. S. Coast and Geodetic Survey, Annual Rep. for 1890*, app. 19, p. 759, note, 1891.

For data on the physical conditions at Bering strait see:

W. H. Dall, Notes on Alaska and the vicinity of Bering Strait, *Am. Journ. Sci.*, XXI, Feb. 1881, pp. 104-111, and map.

are sharply differentiated, and that Bering strait, or perhaps I should say the deep submarine valley entering Plover bay just west of the strait, separates two markedly distinct faunas.

If we take the Quaternary vertebrata, the woolly rhinoceros on the Asiatic side, with the musk ox and the mazama (Rocky mountain goat) on the American side, have left their bones scattered on the surface close to the strait, but neither has been found on the opposite side. The existing mountain sheep (*Ovis nivalis*) of the mountains west of the strait and that of the Seward peninsula east of the strait (*O. dalli*) are very distinct species. Even the harlequin seal (*Histriophoca*), common within a few miles of the strait in Asia, is not known from America.

Birds like the spoonbilled sandpiper and the Siberian bulfinch are known from America only by a single straggler in each case, while the former at least is far from rare in Plover bay. Scores of American birds will occur to the ornithologist as abundant in western Alaska yet unknown from eastern Siberia. If the land had been continuous in the Quaternary would not many of them have extended their range to both continents and continued their visits, by inherited tendency, during present conditions?

Too much weight must not be laid on these facts, yet it cannot be denied that they have some significance.

I was told by the natives that, though the ice in the strait is rarely at a standstill in winter, American caribou even now occasionally cross, only to meet their fate at the hands of the native hunters. Foxes, Arctic hare, and the polar bear roam freely over the ice; and are occasionally seen on bits of floe when ice breaks up in the spring. If the ice were stationary in the strait, as may well have been the case at times in the past (since the heavy floe occasionally very nearly touches bottom there at the present day) it may well have afforded a road to primitive man not less hardy than the animals upon which he subsisted.

It is therefore eminently probable that the migration from Asia took place when the culture of the invaders was sufficiently advanced for them to be able to cross the strait in canoes; or, like the present Eskimo, they may have during glaciation followed the

marine mammals, the walrus and the seal, along the edges of immoveable floe ice closing the strait perhaps for some centuries.

One other hypothesis remains. The elevation of the Seward peninsula may be correlated with a sinking of the seabottom in the region of shallow water north of Bering strait.

Whaling vessels cruising in the vicinity of Wrangell island in open seasons report to me the existence of bright green spots of vegetation on its shores, such as are, a little farther south, the invariable sign of the existence of a prehistoric kitchen-midden; also the Point Barrow people have myths and legends of a people clad entirely in skins of the polar bear who live somewhere in the unexplored part of the Polar sea to the northwest. These people are very real to them; even a few years ago, Capt. Herendeen was called out of his hut during the arctic night, because a party of these Polar people had, it was alleged, been seen by some of the Point Barrow people far out on the floe to the northwest of the Point, traveling with hand sledges. Men who disappear when hunting seal on the edge of the floe in winter are sometimes believed to have either joined some party of the Polarites or to have been killed by them. Whatever weight, if any, we may place upon such ancient beliefs, and whatever measure of probability we may allot to the hypothesis of former land-bridges to the north of Bering strait, the fact remains that there is as yet nothing pointing to the likelihood of any more substantial connection of the two continents than exists at the present time, at least during the period when primitive man may have invaded America.

#### PALEONTOLOGICAL EVIDENCE BEARING ON THE PROBLEM OF THE ORIGIN OF THE AMERICAN ABORIGINES

By JAMES W. GIDLEY

That man did not make his appearance in America until long after he was known to have existed in Europe and Asia is generally conceded by vertebrate paleontologists. Up to the present time the earliest authentic geological records of the existence of prehistoric man in America have been found only in beds of comparatively recent date, the formations containing such evidence being

certainly of later date than the middle Pleistocene, and probably not older than the post-glacial epoch.

In contrast with the careful and systematic way in which the Pleistocene mammals of Europe have been studied, our knowledge of the fauna of that age in North America is at present very unsatisfactory, and many of our theories and speculations concerning it are based on insufficient and incomplete data, which are much in need of a thorough revision. However, regarding the more conspicuous mammals at least, their general character, order of appearance, and probable origin have been fairly well worked out, and may throw some light on the probable time of appearance and place of origin of the American aborigines.

At the beginning of the Pleistocene, European mammals of modern type first began to make their appearance in North America. These and subsequent arrivals of Old World forms, together with the species indigenous to the country, and with the great edentates and other South American forms which had made their way into North America by way of the Isthmus of Panama, united to form on this continent, in mid-Pleistocene time, a vast assemblage of most varied forms of mammal life. Included in this fauna were many species of true horses, camels, llamas, tapirs, great ground sloths and armored glyptodonts, many varieties of bisons and other bovines, the prong-horn (*Antilocapra*), peccaries (*Platygonus*), the great beaver-like rodents (*Castoroides*), at least two species of elephants (*Elephas imperator* and *E. columbi*), the American mastodon, great saber-toothed tigers, bears (*Arctotherium*), and amphicyonine dogs.

During the later glacial and interglacial epochs there was a gradual extinction or dispersion of nearly all of these older types, while the invasion of North America by European and Asiatic types continued. Among these later arrivals probably came many of the mammals found inhabiting this country at the time of its first exploration by historic man. Thus the later phases of the Pleistocene witnessed the first appearance in North America of such modern mammals as the musk-ox (*Ovibos*), the moose (*Alces*), the modern bison (*Bison bison*), the elk or wapiti (*Cervus*), the

caribou (*Rangifer*), the mountain sheep (*Ovis*), the mountain goat (*Oreamnos*), and the modern bears (*Ursus*). The northern mammoth (*Elephas primigenius*) seems also to have crossed into America about this time. It was probably with this later fauna that prehistoric man found his way across the land bridge from the Old World and established himself in America.

That there was a land connection between North America and the Old World at the beginning of the Pleistocene, there can be no doubt, and that it existed again as late as the close of the last glacial and probably well into the post-glacial epoch, is also reasonably certain. But as to the location of this land bridge—whether it connected North America with Europe by way of Greenland, or with Asia by way of Alaska, is not so definitely indicated by the fossil mammalian evidence. The question as to whether there ever had been a land connection between Europe and Greenland, or even that one existed during the early Pleistocene, does not enter here, as the problem before us concerns only the land connection that existed at the time man first appeared in America and over which he must have passed to reach this continent.

The character and distribution of the Pleistocene and recent faunas that found their way to America from the Old World point very definitely to an Alaska-Siberian land bridge as being by far the more probable route. The finding of the remains of the northern mammoth (*Elephas primigenius*) in such abundance along the Siberian coast, and distributed over Alaska and southward along the terminal border of the retreating ice sheet, as well as the presence of numerous remains of the horse, bison, musk-ox, caribou, moose, wolf, beaver, etc., found in the Pleistocene deposits of Alaska, very materially supports this theory. Good evidence is also furnished in the fact that, of the great number of European types of mammals represented in North America, the only authentic species yet found, common to the two continents, is the hairy mammoth (*Elephas primigenius*). This would indicate that the European genera which spread to America did not find a direct route permitting a sudden introduction of unchanged species, but rather that they found their way slowly across the great conti-

inent of Asia and thence into North America, the transit of European species occupying a sufficiently long time of accomplishment to allow a recognizable change of characters. Within the great continent of Asia there was probably also a common center of dispersion from which both Europe and North America derived many species of closely allied forms. At the close of the Pleistocene, therefore, the greater part of the fauna of North America was probably the result of dispersion from Europe through Asia, and directly from Asia to North America by way of the Alaska-Siberian land bridge.

The present distribution of the living mammals also strongly bears out this conclusion, for all the introduced North American species more closely resemble their relatives in the Asiatic provinces than they do those of Europe, while all the Old World genera having American representatives are either purely Asiatic types or if European also extend their present range across Siberia to the Bering strait. This is true not only of the large mammals, as the moose and reindeer, which range from northern Europe eastward across the whole of Siberia, and the elk, or wapiti, and mountain sheep, which are of Asiatic origin, but of such widely diversified forms as the beaver, the microtine rodents, the hare, the marten, the weasel, the otter, the wolverine, the wolf, the large brown bears, and probably the red fox. A strong argument for the comparatively recent existence of this northwest land bridge may be derived from the fact that the North American species of Old World origin still closely resemble their Eurasian relatives, those of either side of the Bering strait not differing from each other more than related species of adjacent provinces within either continent.

Regarding the probable prevailing physical conditions, at the close of the Pleistocene, that would have induced primitive man to cross such a land bridge as existed between Asia and Alaska, the mammalian evidence seems to show in a fairly conclusive way that the connecting strip was comparatively broad and vegetative, thus forming an inhabitable land route by means of which, either in pursuit of his favorite game, or through his natural instinct for travel and exploration, man might easily have found his way by

slow degrees across from Asia into North America and thence down the Pacific coast. Sufficient reasons for this conclusion are fairly obvious from a study of the foregoing statements regarding the successive invasions of North America during the Pleistocene by such a wide variety of forms. Few of these invading forms were strictly Arctic species. Most of them were forest living, or forest and plains species. Hence, while it might be possible for one or two species of the large and hardy boreal types to have reached America through having been driven across a barren waste or ice sheet, of considerable extent, by a long-continued storm or some other extraordinary means, a land connection of such a character would ordinarily prove almost as effective a barrier to a majority of the species that found their way across as a high mountain range or a strip of open sea. The great number and wide variety of forms of mammals that must have crossed this land bridge seem, therefore, to indicate that plant dispersion must have preceded that of the animals, which, in turn, preceded the coming of the first primitive man to America. The complete cutting off of the Arctic current and the consequent increased influence of the Japanese current is sufficient reason for supposing that the climate, at least along the coast route, was comparatively warm and equable.

### *Summary*

The evidence of vertebrate paleontology, therefore, while it may not be altogether convincing, seems to indicate the following:

1. That man did not exist in North America at the beginning of the Pleistocene, although there was a land connection between Asia and North America at that time, permitting a free passage for large mammals.
2. That a similar land connection was again in existence at the close of the last glacial epoch, and probably continued up to comparatively recent times, as indicated by the close resemblance of related living mammal species on either side of the present Bering strait.
3. That the first authentic records of prehistoric man in America have been found in deposits that are not older than the last glacial

epoch, and probably of even later date, the inference being that man first found his way into North America at some time near the close of the existence of this last land bridge.

4. That this land bridge was broad and vegetative, and the climate presumably mild, at least along its southern coast border, making it habitable for man.

#### THE DISTRIBUTION OF ANIMALS AND ITS BEARING ON THE PEOPLING OF AMERICA

BY AUSTIN HOBART CLARK

In considering the possible routes by which the human population, almost universally acknowledged to be of foreign origin, reached America, it is of importance to consider the evidence to be gathered from the study of the present distribution of animals, for, after all, men, though singularly specialized in regard to the brain, are but animals, subject to the same stimuli, to which they react, particularly when living in a primitive state of cultural development, in essentially the same way.

Among the so-called lower forms of life no two types agree in the details of their distribution, though the same general facts hold good for all. As a basis for discussion we should choose a group the component species of which are, from their habitat, the least subject to the influences of climatic change, as well as the least subject to the ravages of external and internal enemies and parasites; a group whose species, through the developmental history of the individuals, are the least likely to be carried by winds or currents, and subsist upon food of such a character that an adequate food supply is everywhere present and everywhere practically uniform in quantity and in quality; a group composed of forms stable enough to retain a specific, or at least a generic, entity under widely varying geographical conditions, as well as under slowly changing local conditions; and a group which possesses a reasonably complete paleontological record, yet includes few enough forms so that all of its constituent species may readily be borne in mind. But we must never lose sight of the fact that conclusions based upon the study of a single group of animals must always be tested in the light of data acquired from the study of other groups.

In the whole animal kingdom the one group which best meets the several requirements detailed above is that of the Crinoidea. The central East Indian region is the center of distribution of the present crinoid fauna of the world, and apparently was also the chief center of distribution of all the faunas of the later geological horizons.

The faunal conditions in the regions about Australia show that the Australian continent was once much larger than it is now, and included New Guinea and the Aru islands, though not the islands farther to the west and to the north. This old Australia gradually subsided, especially toward the northwestern and northeastern corners, restricting the land area to the dimensions of the Australia of today.

The southern part of Australia was once connected with southern South America, and it was by way of this land bridge that temperate South America received a large part of its present fauna.

From the faunal conditions in the Lesser Sunda islands we are led to assume a more or less complete, though not necessarily continuous, land connection between these Lesser Sunda islands, Madagascar and southeastern Africa, possibly including the Maldivian islands and Ceylon. While among the terrestrial forms this connection is just as emphatically indicated, we find little or no trace of it in continental Africa, for the reason that Madagascar was very early cut off from Africa before the connection with Asia was established, this connection having resulted in admitting into Africa a fauna that very soon entirely changed the aspect of its original fauna, which we now find indicated in isolated colonies on Madagascar and on the Mascarene islands.

We are similarly led to suggest the existence, at a somewhat later date, of a great South Sea Island continent or at least of a great South Sea archipelago, of which New Zealand, the Marquesas and Hawaiian islands, and Japan indicate the eastern and northern boundaries, and the Lesser Sunda islands the southwestern, being connected with New Zealand in some way to the northward of New Guinea. It is possible that the Philippine islands, Borneo, and Celebes, as well as Java and Sumatra and the southern part of

Indo-China, formed the highest part of this South Sea Island land. This would account for the generalized nature of the present crinoid fauna of these localities, the component species of which practically all exhibit primitive characters, as a comparatively recent introduction into an area recently submerged. This fauna cannot be satisfactorily resolved into any distinct constituent elements; yet it is singularly heterogeneous and diversified; hence it appears to indicate not only an area of submergence but also a region of constant and comparatively sudden geological changes, which have constantly rejuvenated the fauna and throughout the region have prevented the crystallization of the various forms into fixed and definite faunal types.

Along the western coasts of South and North America, from the Straits of Magellan to the Aleutian islands and thence down the coast of Kamchatka and the Kurile islands to Japan, the fauna is quite uniform. This fauna presents a number of peculiarities; in its northern part all of the component species, while near the mean of their respective genera, are exceedingly variable, and present all the characters shown by species introduced into a new country. We may therefore assume that the fauna has reached this portion of its range within comparatively recent centuries. In the Okhotsk sea, about the eastern and southern coast of Sakhalin, and thence down the west coast of the Sea of Japan as far as Korea, we find an arctic fauna similar to that of the seas from western Greenland and Nova Scotia to the Kara sea, though entirely disconnected from it. A trace of this fauna also is found just east of the Commander islands, dividing the typical Magellanic fauna of the region.

The Magellanic fauna scarcely intrudes into the Bering sea beyond the Aleutian islands, and is not known in Kamchatka except along the southern coast. Thus we assume from the data at hand a very broad connection within comparatively recent epochs between northwestern America and northeastern Asia, extending at least as far south as the Aleutian and Commander islands, and probably taking in on the north Wrangel island and the New Siberian islands. Such a land, washed by the warm currents from the southward, would have an equable temperate climate, something like that of Puget sound.

This Magellanic fauna is cut in two by a southerly extension of the arctic fauna, which has spread as far southward as the Sea of Japan. This is a fact of the greatest significance. The breaking through of the broad Asiatic-American land connection by a strait leading to the Arctic ocean would permit of the southern extension of a cold current from that ocean. That such a cold current from the Arctic ocean actually existed is indicated by the arctic species in the seas of Okhotsk and Japan and east of the Commander islands; moreover, this Arctic-Pacific connection must have been of considerable depth, for one of the species groups that has intruded into the Pacific does not occur above 743 fathoms and is otherwise confined to the colder stagnant bottoms of the Arctic. It seems probable that, once a current cuts through a land, the strait formed is very rapidly deepened to the limit of the action of the current; thus the considerable depth of the channel between the Commander and western Aleutian islands does not necessarily indicate any great age; at any rate it must have been carved out since the extension of the Magellanic fauna to the region, as this fauna occurs on either side of it, but could not ever have passed through it. As the northern portion of the Magellanic fauna is the youngest fauna known to us it is evident that the intrusion of the Arctic types into the Pacific across this part of the Magellanic fauna must have been a very recent occurrence.

The entry of this cold current into the Pacific across the Bering Sea region must have had a most powerful effect upon the fauna and flora of the lands on either side of it. As a result these lands became much colder and the fauna, especially the terrestrial, was forced to fall back to regions unaffected by its influence so that similar forms occurred on both coasts of the Pacific in widely separated localities far to the southward of their original habitat.

More recently there appears to have been a rising and a filling in of the region about Bering strait, especially toward the Alaskan side, by ice- and water-borne material, by which the effect of the Arctic current has been lessened, so that Kamchatka and the Commander islands have again become capable of supporting a more or less temperate fauna and flora which, however, are not

derived from the remnants of the original fauna and flora but are entirely new introductions from the southward that have driven the arctic fauna and flora northward before them. This accounts for the difference in the fauna and flora of corresponding parts of Asia and America in the Bering Sea region; in America we find abundant traces of the old Bering Strait fauna and flora, but in Asia these have been largely submerged by recently developed types, which have spread northward from more southern regions.

We have good circumstantial evidence that man existed long before the Bering straits were broken through, though not that he existed in this region. We know that in Europe man was contemporaneous with the mammoth, for we find bones with figures of the mammoth rudely drawn upon them. Thus we may suppose that man was also contemporaneous with the mammoth in Asia. Now the submergence by which the Bering sea was carried below the surface also cut off a large island from northern Siberia. As the subsidence continued, this island became gradually smaller and the mammoths upon it therefore became crowded into a smaller and smaller area, where at last they all died. The enormous numbers of mammoth skeletons on the New Siberian islands (now one of the chief sources of ivory) can be interpreted only as the result of the separation of these islands as a very large island from the mainland and the gradual restriction of this land mass in size until it reached its present dimensions. This possibly took place after eastern Asia was inhabited. But to join the New Siberian islands to Siberia the general surface of the land would have to be raised sufficiently to bring most of the bed of the Bering sea above water; therefore we are reasonably safe in assuming that the land connection across the Bering sea was in existence after man could have inhabited the region. The extinction of the mammoth in Asia was probably due to the breaking through of the cold arctic current, by which the climate was made too severe for such a specialized type. It could not migrate to the southward because of the deserts and the mountains in that direction and, deprived of a large part of its food supply by the dying away of the rich subtemperate flora, it perished entirely. All of the more specialized animal types, like man, the

higher apes, and all large mammals, live under the most delicate ecological adjustment and are singularly sensitive to any environmental change. Let the ecological factors under which they live be modified ever so little, and they disappear.

The highlands of Central and South America and the West Indies were once joined with south-central Africa and Madagascar; but the disruption of this land bridge, which was possibly contemporaneous and continuous with that from Africa to the Lesser Sunda islands, occurred before the intrusion of predaceous mammals, or indeed of any of the larger mammals, into Africa from Asia.

In the Indian and Pacific oceans we thus find indicated:

1. An Indian Ocean land, including southeastern Africa and Madagascar and extending thence to Ceylon and the Lesser Sunda islands from Sumbava to Timor, and probably more or less connected with Australia. Very early this became cut up, disintegrated, and almost totally disappeared.

2. Subsequent to this (as is indicated by more numerous and more specialized diagnostic species) a South Sea Island land or gigantic archipelago, the boundaries of which are delimited by Formosa, southern Japan, the Hawaiian and Marquesas islands, New Zealand, New Caledonia, the Solomon islands, New Britain, the Moluccas, and the Lesser Sunda islands. Possibly the Philippines, Celebes, Borneo, Java and Sumatra, and the Malay peninsula also formed part of this territory. This also subsided many ages ago, the subsidence beginning and being most marked in the eastern part, and becoming broken up into small islands, which in many cases have succeeded in remaining above the sea through the building up of volcanic chimneys as they went down, or by building up coral chimneys on the crests of their mountains, or by both processes combined.

3. Possibly contemporaneous with this last, though quite separate from it, an Australian continent including Australia, New Guinea, and the Aru islands. This has also subsided, especially in the northern part where a broad sea, the Arafura sea, now covers a large area which was once land.

4. A land, possibly a northward extension of the Antarctic con-

tinent, connecting Australia and southern South America. Certain features of the culture of the Patagonians and Fuegians have been interpreted as indicating an affinity with the natives of Australia, but on biological grounds the possibility of human migration from Australia into Fuegia is very remote.

5. A very broad land with an equable temperate climate connecting Asia and America, at a time long subsequent to the above-mentioned lands.

In the Atlantic ocean we find indicated:

1. A land including the highlands of Central and South America and extending to south-central Africa and Magadascar; this probably became broken up at the same time that the land connecting Madagascar with the Lesser Sunda islands disappeared; it was possibly a western extension of the same land mass.

#### *Summary*

According to the evidence of biological paleogeography, man probably reached America over the broad land that formerly existed across Bering sea, and since he reached America this land connection became disrupted and the whole region acquired an Arctic climate.

A few accidental visitors may have wandered across the Pacific from the South Sea islands; but this could have been only after the perfection of the art of navigation by these people, and America was probably settled long before navigation or boat building had reached any advanced stage. It is unlikely that any number of people ever came across the Pacific because of the enormous distance to be traversed with both wind and current against them. Such visitors as might have come by this route can be considered only as purely accidental; their survival on arrival is very doubtful, for primitive men, like the anthropoid apes, are singularly sensitive to any change in their environment. To be worthy of serious consideration any migration route by which primitive men may be supposed to have entered a country must be shown to possess the possibility of very gradual acclimatization and very gradual adjustment to the new conditions. The difference between the conditions in the South Sea islands and on the western coast of South America

would in itself seem to be a conclusive argument against the settlement of America by that route.

There is no evidence that man could have come from Africa by the Afro-Antillean land bridge; probably Africa itself was uninhabited by man at the time that this bridge was disrupted.<sup>1</sup>

BEARING OF ARCHEOLOGICAL EVIDENCE ON THE PLACE OF ORIGIN AND  
ON THE QUESTION OF THE UNITY OR PLURALITY OF THE  
AMERICAN RACE

BY WILLIAM H. HOLMES

The problem of the origin of the American race as such may be quite a distinct problem from that of the origin of the human race, that is to say, of the genus *Homo*, since, if the racial elements going to make up the population of the New World were decidedly diverse—as partly Mongolian, partly Malayan, and partly European—the place of amalgamation would be the place of origin, and that place would be America. Indeed, it seems self-evident that an American race, howsoever evolved and constituted, must have its place of origin on American soil, since, if formed elsewhere, it would not be American, save by adoption.

The problem is somewhat complicated by the possibility that the human group may have had its origin within the land area now embodied in the continent called America, in which case since we agree on the question of primary racial unity—the Old World races must appear in the light of offshoots of an American stock, but the proposition that the American continent nurtured the human stem is not well sustained by the evidence so far adduced; besides it is incredible that the American race, represented today by hardly more than ten million people of homogeneous physical type and primitive culture, should have peopled the Old World with three races highly differentiated in physical type and in cultural achievement and comprising the bulk of the world's population. With regard to this question, the consensus of opinion among students of the subject favors the view that the Old World gave birth to the human kind. Traces of human occupancy are found in the Old World associated

<sup>1</sup> The evidence afforded by the study of recent marine organisms indicates that this land bridge was disrupted during the Cretaceous.

with geological formations that may be safely assigned to the close of the Tertiary period, and it is incumbent on those who hold to the theory of American origin to establish an earlier occupancy of the New World. Two regions only in America have furnished testimony worthy of serious consideration in this respect—California and Argentina. The testimony in both of these cases is striking and picturesque, giving American man a place in the far Eocene, and is supported with much enthusiasm by a few students who are ready to stake their scientific reputations on the outcome. Recent investigations relating to North American as well as South American early man show that the testimony, if it is to stand, must have much additional support.

In view of these conditions, the theory of an autochthonous origin of the American race may be set aside, and the problem of the arrival in the New World of racial elements originating in the Old World need alone receive consideration.

Archeology can supply but meager evidence of the early arrival of migrating peoples. Relics of human handiwork have been reported from the glacial deposits, which are post-Tertiary, but they are few and far between, and even if properly authenticated, they can tell no story of racial origins; they are not labeled. We may learn from such evidence that man was present at a definite geological period and that his culture was primitive, but we get no clue as to his race or to the direction from which he came. The evidence furnished by osseous human remains is negative as to both great antiquity and unity or diversity. In two cases crania presenting characteristics quite distinct from those of the known aborigines have been brought to the attention of anthropologists—the low-browed skulls from the bluffs of the Missouri, which Dr Hrdlička has shown to correspond to skulls of members of recent tribes; and two crania equally remarkable and un-Indian in type obtained from the glacial gravels at Trenton, which Dr Hrdlička has shown to be of peculiar German or Dutch type.<sup>1</sup> Possibly they belong to Hessian hirelings killed in the battle of Trenton.

The archeologist, in pursuing the inquiry regarding racial origins

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<sup>1</sup> Hrdlička, Aleš, *Bull. 33, Bureau of American Ethnology.*

for America, must then turn to the great body of antiquities that are generally recognized as belonging to the Indian tribes and their ancestors. Like the race itself, these remains form a comparatively homogeneous unit, being confined practically to the stone phase of culture. It is observed that this body of material does not seem to contain any element or trace of pre-Columbian European influence back to the beginning of our civilization. The Indian tribes were without Old World beasts of burden and without wheeled vehicles, or sail-rigged craft, the great modern agencies of transportation; they had no cattle, sheep, or goats, potent factors in the development of Old World sedentary life; they had no knowledge of iron or the smelting of ores, essentials in the development of the civilized state; no keystone arch, a requirement of successful building; no glaze or wheel in the potter's art; no phonetic alphabet, the stepping-stone from barbarism to civilization. We conclude from these facts that America had no important contact with the cultured peoples of the Old World before the sailing of Columbus. What, then, can archeology show that has a significant bearing on the arrival of trans-oceanic peoples in such numbers as seriously to affect the make-up of the American race?

Omitting for the present any consideration of the open gateway from Asia to America at the far northwest, through which we all believe the chief currents of population came, let us examine such evidence as may be available of arrivals through other avenues of approach. As the continents stand today, and with primitive means of migration, there seems small chance of the arrival of wayfarers in any considerable numbers on the American shores, and the evidence of such arrivals must be far to seek and difficult of evaluation. A primitive boat's crew reaching the western continent as voluntary voyagers or as wayfarers brought unwillingly by the winds and currents, even if hospitably received by the resident population, would leave no physical trace of their presence that would last beyond a few generations, and the culture they happened to represent might not find even a temporary foothold. Yet germs of culture have sometimes wonderful potentialities, and a very simple device, technical suggestion, or tenet of belief might catch

the primitive fancy, engraft itself upon the native culture, and in a very short period of time influence the whole current of its development. The question is, however, one of race and not of culture, and the presence in America of numerous culture elements coming from trans-Atlantic sources, even if plainly manifest, might mean very little with respect to racial make-up.

We may now inquire into the nature of the archeologic evidence which might seem to warrant the conclusion that foreigners had arrived even in numbers sufficient to plant a few germs of culture; but first it is necessary that we exclude from the body of material to be considered all handiwork that bears the taint of post-Columbian influence since modern Europeans reached American shores. We have to consider also—lest we misinterpret the evidence—the similarities, analogies, and identities between the culture achievements of peoples quite foreign to one another historically and genetically that arise and must arise from the like constitution everywhere of the human body, the human mind, and human environment. It is not wise to throw evidence of this class entirely overboard, for it may possess value of very different degrees—the similarities ranging from the merest fortuitous resemblances to correspondences so close and intimate that actual intercourse may be safely inferred. The nature of such evidence may be briefly considered.

The student examining certain collections of primitive antiquities discovers that a particular form of chipped flint knife-blade occurs in America and also in the Old World, and explains the occurrence by the oft-observed fact that with given state of culture, given needs, and given materials, men of all races reach kindred results. When, however, he observes that the blade of the knife in each case is hooked at the end, keen and highly specialized, he wonders how such correspondence could occur. Pressing his investigation further, he discovers on the two continents other knife blades of chipped flint with curved and keen point and identical specialization to facilitate hafting, and a further identical elaboration for purposes of embellishment, and he begins to inquire whether the people concerned in the making of these two groups of artifacts are not related or have not

in some way come in close contact. His interest is intensified when he observes that the groups of closely identical blades occur in two trans-oceanic areas at points of nearest approach, and also not in any case at more remote localities on the respective continents, and he is astonished to discover further that the two areas involved are connected by oceanic currents and trade winds by means of which seagoing craft could make the ocean voyage from continent to continent with comparative ease. Later he finds that other objects of handicraft belonging to these adjacent areas have similar correspondences, and his previous impressions are decidedly strengthened. When going more deeply into the investigation, he learns that similar phenomena occur elsewhere, that in numerous localities on the shores of the one continent the culture traces have close similarities to those of the adjacent trans-oceanic areas, and no such resemblances elsewhere, and he concludes without hesitation, and concludes safely, that contact of peoples and transfer of trans-oceanic cultures have taken place not only at one but at many points.

Now, this is a purely suppositional case, but it is suggestive and justifies us in pursuing further in this direction the interesting problems of American origins. I may call attention to certain noteworthy analogies that do occur between American and foreign archeological remains. In New England and farther north we find a highly specialized form of the stone adze usually known as the gouge, which is abundant in the region mentioned, but fades out gradually as we pass to the south and west, with rare outliers in the Carolinas, the Ohio valley, and the western Lake region, but not appearing elsewhere on the continent. It does appear, however, in northern Europe where the Atlantic is narrowest and most fully bridged by intervening islands. Within the same region in north-east America, and thinning out as does the gouge to the south and west, is an object of rare and highly specialized form, an ax-like implement, known as the bannerstone, with perforation for hafting and extremely varied wing-like blades. It is not found elsewhere in America. In northern Europe we find a drilled ax of similar shape. It is a noteworthy fact that this implement in the Old World was probably a thing of use, while in America its functions were sacred and

ceremonial. It may be worth while to suggest the possibility that in prehistoric, pre-Ericsson times the germ of this type of implement found its way across the intervening seas, and that, being regarded with veneration, it became a symbol of exceptional regard.

On the Atlantic shores of America, in the West Indies, and in Brazil there are certain forms of implements and pottery that resemble more closely the corresponding fabrications of the Mediterranean shores than do those of other parts of America. In the Isthmian region we find works in gold and silver and their alloys that excite wonder since they display skill of an exceptional, even remarkable, kind, and the methods employed, as well as the forms produced, suggest strongly the wonderful metal craft of Nigerian tribes of old Benin. And we observe that the trade winds and currents of the Atlantic are ever ready to carry voyagers from the African shore in the direction of the Caribbean sea.

Even more remarkable and diversified are the correspondences between the architectural remains of Yucatan and those of Cambodia and Java in the Far East. In both regions the chief structures of the cities are pyramids ascended by four steep stairways of stone, bordered by serpent balustrades and surmounted by temples which employ the offset arch and have sanctuaries, altar tablets, and glyptic inscriptions. The walls are embellished with a profusion of carved and modeled ornaments and surmounted by roof crests of elaborate design. There are present also, as supports for the great stone tables and the lintels of the doorways, dwarfish Atlantean figures duplicating those of the antipodal cities. Some of the figures represent whiskered men. The significance of all this has been sought again and again without satisfactory result, and I shall not here venture to present an explanation.

On the Pacific side of the American continent strange culture coincidences occur in like degree, seeming to indicate that the broad Pacific has not proved a complete bar to the intercourse of peoples of the opposing continents. It has been often remarked that the faces of modeled and sculptured figures in southern Mexico have a Mongolian cast and that the eyes are decidedly oblique. The stone adzes and pestles of the northwest coast resemble the adzes

and pestles of the Pacific islands more closely than they do the corresponding tools of the eastern shores of America, and the peculiar flat-bodied stone club or *mere* of the Samoan and other islands is distributed along the Pacific coast and scattered sparsely over the adjacent regions to the east. Passing over other instances that might be cited, we find that we have completed the circle of the continent and are approaching, as has often been done before in the study of these problems, the main gateway to the continent at Bering strait, about which enough has already been said during this discussion. Through this gateway at one period or another the main currents of incoming people have passed, but the time may have been long and the racial elements diversified, so that the actual place of origin of the American race as such would be the place on the American continent where these elements were remodeled into a new people.

The question of the unity or plurality of the American race is thus a question simply of the unity or plurality of the elements embodied in its make-up. If the cradle of the human race was in the Old World, the American race would consist of such elements as happened to find their way to the uninhabited continent; if in very early times the elements might be derived from some paleo-Asiatic or other early race not now in evidence; if later, they might be one or more of the known races of the cradle continent; if more than one, there would be plurality of racial elements in the American composition; if only one, the condition known as unity would prevail.

I agree fully with Dr Hrdlička that Asiatic peoples must have furnished the great body of immigrants to America, but it seems to me also highly probable, considering the nature of the archeological evidence, that the Western World has not been always and wholly beyond the reach of members of the white, Polynesian, and perhaps even the black races.

## SOME ETHNOLOGICAL ASPECTS OF THE PROBLEM

BY ALICE C. FLETCHER

Looking at the tribes that dwell on this continent, and particularly in North America, one notes many and important ethnological and psychological resemblances. To give a few of the more striking examples, we see that the idea of duality is generally expressed in their social organization, not that each tribe is divided into two parts or sections but that the various kinship groups composing a tribe are apt to be so combined as to express a recognition of the apparently dual natural forces, represented by Day and Night, Summer and Winter, Sky and Earth. This duality concept sometimes takes on an anthropomorphic form and the forces are regarded as male and female, or, they are reflected in social conditions, and represented as War and Peace. The two parts always stand for dissimilar but complementary forces or powers.

Not only in the tribal organization does this duality concept appear, but it is to be found reflected in many of the religious ceremonials of the people. It is to the latter that one must turn for the more direct expression of "religious ideas." It may safely be stated that among the American race what may be termed "religious ideas" are fundamental to all ceremonials and upon them is built the tribal organization.

These "religious ideas," briefly stated, are founded upon the native conception of the cosmos. In this conception man views all things from his own personality and from this standpoint predicates his relationship to animate and inanimate nature.

Conscious within himself of an ability to move and to bring to pass, he regards motion, whether of body or of mind, as a universal ability and as the simplest and most fundamental manifestation of a mysterious, indwelling power that has brought all things into existence and is the cause of all movement; of the winds, the clouds, the storm, the rivers, the growth of vegetable forms, the activities of animals, and the physical and mental life of man. There is no visible thing within which this mysterious power does not dwell and that is not made active or stable by it. To man, this mysterious

power is invisible and only knowable indirectly through its manifestations in nature and living forms. Since all things (for nothing to the Indian is strictly inanimate), including man, derive life and motion from this mysterious power, all things are regarded as, in a sense, related to each other, because of the mysterious power that pervades and sustains all natural forms.

Such a view makes possible a psychical as well as a physical connection between the Indian and all natural objects and renders conceivable the belief that there may be a possible action and reaction between the various natural and animal forms and man.

This conception of man's relation to nature and to the mysterious power that animates and pervades all forms finds expression in a rite that is nearly if not quite universally observed among the natives of our continent, namely, the rite in which man seeks to appeal to this mysterious power through the chanting of prescribed rituals during a lonely vigil and fast, in the hope that he will receive in a vision the sight of some form that can impart to the suppliant added strength and ability for achievement. The apparition seen in a vision is generally of some beast or bird, although other forms sometimes appear. Now, it is noteworthy that, so far as known, the animal forms so seen, and those that are represented in the various tribal ceremonials, or serve as designations of kinship groups, all belong to the fauna of the recent geologic age. No survival of an extinct species has as yet been discovered to have a part in any rites among the different tribes.

Mythical and symbolic creatures have part in some ceremonials, but they are clearly the creations of man's fancy, formed by him to express certain of his ideas, and they never had any real existence.

While appeals by man to an invisible power through fasting and prayer are not uncommon in other parts of the world, yet, the rite so generally practiced in America, by the youth at maturity, or by the man who seeks to lead, or to obtain magical powers, shows such similarity as to suggest a past unity or derivation from a common source ancient and traditional; here and there this rite is augmented by tribal or ceremonial peculiarities, but fundamentally it remains the same.

It seems not improbable that this widespread rite has been a factor in the development of one of the characteristics of the American race, that is, a mental seriousness. This seriousness is present in all the Indian's practices, whether they savor of rank shamanism or belong to social or ceremonial procedures replete with geniality, united movement, and song.

From these and numerous other facts it seems safe to conclude that the Indian shows throughout a considerable resemblance in his fundamental subjective and objective conceptions. His mentality is distinctly of one type, and on the whole may be regarded as well advanced in scale. These conditions lead the ethnologist to the belief that the Indian represents one branch or a part of one branch of humanity, and a branch that in mental development is now, and probably was when it reached this continent, much above what must have been the more primitive forms of man.

#### SOME ETHNOLOGICAL ASPECTS OF THE PROBLEM

By WALTER HOUGH

The general interest in the early peopling of America has been long sustained, and many branches of science have contributed in the effort to elucidate the problems connected therewith. Ethnologists have endeavored mainly to trace the culture affinities with other regions, especially with the contiguous regions of Asia and America, and much success has rewarded their studies. For a number of years I have been interested in noticing similarities in arts of wider scope geographically, and have compared the arts of tropical America with those of Malaysia, the latter area being now quite thoroughly represented in the National Museum through the immense collections of Dr W. L. Abbott.

The question of acculturation is beset with great difficulties, which render a clean-cut determination of the transmittal of arts and inventions from one people to another only rarely possible. The lacunæ in our knowledge are in some degree responsible, since the migrations of inventions proceed by obscure paths and are almost never recorded by history; in effect, the modern ethnologic min-

glings are on a par with those of prehistoric times, which, although fascinating, leave us often breathless after a long and fruitless chase and receptive to theories of independent invention as the other horn of the dilemma.

It is an axiom of science that one should err on the side of excessive caution in the effort to get at the facts of similarities of invention, and no other subject of anthropology has produced so many harebrained experiences.

It is evident that the transfer of arts has been common in sub-arctic Asia and America and some of these arts have wide connections. A few of these may be discussed.

*Drill*.—The most specialized form of fire-making and boring apparatus, the four-part drill, which exists in America among the Eskimo and some Canadian Indians, is found in eastern Asia, India, and Borneo, as well as in Europe. The pump-drill has a wider distribution in America, Europe, and Asia, but is not found in Africa. The flint and pyrites strike-a-light is distributed in Europe, where it occurred in Neolithic times, and in far northern America.

The simple two-stick fire-drill has a world-wide distribution, and is the only form common to America. In Borneo, however, the diversity of methods points to a composite formed by waves of population.

*Armor*.—Plate armor like that of Japan and Korea, and the horn armor of Mindanao and other East Indian islands, have been observed on both sides of Bering strait, the most perfect type made of plates of ivory occurring among the Eskimo. Among the North Pacific Indians, armor made of plates of wood occurs, to the southward combinations of rods and plates of wood, and in California rods alone are employed. This grouping of methods appears from the literature to have been repeated in part in eastern United States, having a distribution, so far as we have data, into Mexico and Central America, but apparently not into South America.

*Lamp*.—The lamp is extra-American, belonging with simple saucer lamps of Asia and Europe. The Eskimo lamp, however, is a substitute for the stove and fireplace of other peoples and is

unique in the development of the wide-stretched wick line, as well as in its occurrence in the Western Hemisphere. The lamp here has been molded in the hands of the Eskimo, who are the most ingenious aborigines in the world, and whose very existence depended on this homely utensil.

I have omitted a large series of similarities between America and southern Asia, which may or may not indicate relationship but which are inconclusive and subject more or less to explanation as independent or environmental inventions. Among these are the skirt dress, rain coat, palm industries, ear and lip plugs, head compression, teeth inlay, simple fire-drill, calumet, spoon censer, nose flute, lapped edge baskets, and others.

There seem, however, to be inventions having a greater significance which have come into America and there taken a wider range than those just mentioned. These are as follows:

*Blowguns.*—The distribution of the blowgun appears to follow the Asia-America route and has its greatest use in the two extremes, Malaysia and South America. It must be acknowledged that between Malaysia and eastern North America there is a wide gap, which up to the present cannot be filled, except that survivals, as a child's toy, may indicate connection. The distribution in America begins with the Iroquois, extends to the Gulf, appears again in Mexico and Central America, and becomes widespread in tropical South America. The blowgun has not been found in Africa, nor in any other portions of the world except in those just mentioned. It does not depend upon the presence of natural tubes such as those furnished by the bamboo, cane, and other grasses. It is made in both extremes of its range of two strips of wood grooved and joined with cement and wrappings of bark, as may be seen in the specimens of the Jakuns of the Malay peninsula and those of the tribes of the upper Amazon. In Borneo since the introduction of iron the boring is made in solid wood by means of a bar of that metal. The dart of the Asiatic blowgun is often tipped with poison and terminates at the other end with a core of pith, while in America the darts are often poisoned and usually terminate with a wrapping of the down of some plant. The blow-

gun does not seem to be a likely subject of independent invention, on account of the complexity of its conception and the difficulty of its manufacture.

*Sling-bow*.—In connection with the blowgun in Asia and America the sling-bow, which appears alone at the two extremes, is interesting. So far as known, the sling-bow occurs only in the valley of the Amazon and in Malaysia. It consists of a bow with a double bowstring and has a small pouch in the middle to carry the clay pellet. No particular conclusions can be drawn as to the presence of the sling- or pellet-bow in both areas, since if there ever were any intermediate steps, they have been lost. It is only the fact that the blowgun and pellet-bow appear together in both areas that would justify the belief that the two inventions had a common origin.

*Bark Beaters*.—Still another invention, that of the grooved bark beater, of almost world-wide diffusion, has found its way into America; by what route or by what means it is difficult to say. This implement consists of a round or square short club, whose surface is covered with parallel flutings. This invention has arisen in the areas of certain tropical trees, whose matted bark can be expanded more readily by a grooved club. The most familiar product of this character is the tapa of the Polynesian island, or the coarse red cloth of equatorial Africa. The use of this grooved club perhaps was the basis of all primitive paper-making. Irrespective of the question of independent inventions, the easiest route by which this method could have reached America would have been from southern Asia, where this method is practiced. It appears in America in British Columbia and Washington, where it is used on bark of a fissile texture. There are no observed traces of this implement between this area and Mexico, a lacuna which might well occur, provided the clubs were of perishable wood. In Mexico the survivals are of grooved stones to which the author had the honor of first calling attention in 1892. In Mexico this implement is used again on felted or matted fiber bark. From this region the implement is increasingly common into tropical America and from southern Mexico to the Amazon the

decoration of bark cloth in colors assumes the appearance of the art in Polynesia and the East Indies.

These matters are presented with all due reservations and not with the effort to sustain or promulgate any theory concerning the origin and diffusion of these inventions. They may be only a few resemblances amidst a vast host of divergences. On the whole, however, the appearance of these inventions in America has substantiation in the results given by Dr Hrdlička, that the peoples of America most resemble those of eastern Asia, and even if the migration of inventions does not involve the migration of peoples, it tends to show a contiguity of thoughts and preferences.

#### THE BEARING OF ASTRONOMY ON THE SUBJECT

BY STANSBURY HAGAR

The study of the astronomy of the American Indians does not afford any definite evidence of their unity or diversity, or of the period or place of their origin. It neither proves nor disproves their origin in America or in Asia or in any other region. But it does present facts of value bearing upon the development of their culture, of relations between the peoples of America, and of their relations with the races of other continents in the prehistoric period of America.

Astronomy is not a primitive science. Long periods of years indeed must have elapsed before the really primitive man began even to observe the stars with anything less than utter ignorance and indifference, for they were related in no manner that he could apprehend with those material needs to which his attention was practically confined. Primitive astronomy began with the systematic observation of the stars to indicate direction upon night journeys, to indicate the hunting seasons to the hunter, and later to indicate the sowing and reaping seasons to the farmer. The cosmic and the religious element of astronomy—the question as to the nature of the stars and their relation to the nature and life of man and of the cosmos—form, no doubt, one of the earliest bases of religious thought, if not the earliest, but such speculations, when they pass beyond mere wonder, surely imply a higher culture than

the practical uses of stellar observation, and therefore cannot be earlier in time. It is evident, then, that the evolution of man must antedate the beginning of astronomy by a very long period of time. Even if we could trace astronomy back to its earliest source in time and place it would afford us little or no information upon the origin of the earliest man, unless, indeed, he had remained in one spot during the whole of the long intervening period—a manifest absurdity.

Applying the above deductions to the American Indian, if he originated in America, astronomy cannot say when or where. We seem to see several foci of astronomical development, in Peru, Mexico, and Yucatan, corresponding with general culture centers in regions having a climate and topography peculiarly favorable to the advancement of culture. The astronomical lore of all these regions is too nearly identical in complex concepts to be satisfactorily explained as due to similarities of race and of environment. There must have been an interchange of ideas between them either directly or through intervening nations in pre-Columbian times, hence we cannot be certain that this lore is indigenous to any one of the three regions named. Evidence of extensive migrations and of extensive change of climate in comparatively recent times adds to the uncertainty upon this point and prevents us from determining, at least in the present state of our knowledge, even the region of the earliest astronomical development in America.

If the American Indian migrated into America from another continent in primitive times, astronomy would still be helpless to aid us in the search for the time and place of such migration because it cannot reach back to such an early period. But if this migration took place in later times or after the development of astronomical traditions, then indeed we may find in this field concepts sufficiently complex to render it possible for us to trace them back towards their birthplace. It is evident, however, that these concepts bear upon the origin of the American race only if they can be shown to be associated with the earliest race known to have existed on this continent—otherwise they will pertain merely to a later influx of an alien race into an already populated region. Pursuing this

inquiry, then, let us ask first whether the concepts of American astronomy present such analogies with the astronomical concepts of other continents as to indicate intercommunication between them.

In the field of scientific astronomy the pole star was generally known throughout North America as the pivot of the sky, and the position of the South Pole was noted by the Peruvians. At least four of the planets were known and distinguished from the fixed stars by the Peruvians, Mexicans, Mayas, and some of the other tribes. The Peruvians had observed the sun spots and a few among them were perhaps acquainted with the true cause of solar and lunar eclipses. All three peoples had divided the sky into true constellations and possessed a true solar zodiac. The Mexicans had ascertained the period of the apparent revolutions of the planets with remarkable accuracy. But nothing in these facts implies any foreign influence. The lunar and solar calendars of these three advanced nations from the standpoint of the writer's cursory study of them present little more evidence of intercommunication so far as their time periods are concerned, though the system of successive years governed by successive zodiacal signs recently discovered by Boll in Egypt and the Orient certainly suggests certain features of the Maya and Mexican calendars. The presence in Peru, Mexico, and various other parts of America of the Pleiades year of two seasons, divided by seed time and harvest, with its associated myths and rituals presents a stronger argument for intercommunication, one that has been elaborated by the late Robert Grant Haliburton, and Mrs Zelia Nuttall has published evidence in favor of intercommunication based upon cosmogony and concepts which she believes to have been associated with the celestial North Pole.

When we enter the field of symbolic and traditional astronomy the evidence of intercommunication increases. We find among the common concepts the division of the cosmos among the four so-called elements, fire, earth, air, and water, the use of the swastika to express celestial revolution, of the cross and circle to represent the fourfold division of the sky and earth, of the serpent and egg with certain astronomical associations. Among the extra-zodiacal constellations the Bear, formed by some of the stars of our Great

Bear, has been generally recognized by the tribes of the north-eastern portion of North America, probably from prehistoric times. It may be a legacy from the Northmen. The Milky Way as the Path of Souls of the northern tribes and the Celestial River farther south likewise finds European and Oriental analogies. But from the writer's standpoint the crux of the argument for intercommunication rests upon the symbols associated with the zodiac in Peru, Mexico, and Yucatan, for here we are considering not isolated analogies but an interrelated series in which the element of sequence affords an impressive guaranty against both chance and imaginative manipulation.

In Mexico the study of the elaborate system of judicial astrology may yield interesting results. So far as the writer is aware, little or no attention has yet been paid to this subject. In Peru evidence as to the zodiac is derived from the Star Chart of Salcamayhua, which names and pictures the signs, the monthly ritual which reproduces the attributes of the sign through which the sun is passing when the festival is held, and the celestial plan of the sacred city of Cuzco, which was supposed to reproduce the observed design of the sky including the signs. This plan in varying aspects seems to have been typical of several and perhaps of many of the sacred cities or theogonic centers that form such a characteristic feature of American civilization. In Mexico the signs are named and pictured by Duran, Sahagun, Tezozomoc, in the Codices, and on the mural paintings of Mitla; their attributes are described in the monthly ritual and embodied in the plan of Teotihuacan and in the day signs. In Yucatan the signs appear in the Codices, the ritual, the day signs, and the plan of Izamal.

As to possible European influence in these sources, the writer can only state his conviction that an examination of them will convince the student that such influence is either insignificant or totally absent.<sup>1</sup> The following table will briefly indicate the correspondence between some of the concepts associated with the American zodiacal signs and with the signs we have received from the

<sup>1</sup> See the writer's various papers in the Reports of the International Congress of Americanists.

prehistoric Orient. It should be understood, however, that this table refers to only a few of the more obvious analogies:

SIGN	ENGLISH	PERUVIAN	MEXICAN	MAYA
Aries	Ram	Llama	Flayer	
Taurus	Bull (Originally Stag)	Stag	Stag or Deer	Stag
Gemini	Twins	Man and Woman	Twins	Two Generals
Cancer	Crab	Cuttlefish	Cuttlefish	Cuttlefish
Leo	Lion	Puma	Ocelot	Ocelot
Virgo	Virgin (Mother Goddess of Cereals)	Maize Mother	Maize Mother	Maize Mother
Libra	Scales (Originally part of Scorpio)	Forks	Scorpion	Scorpion
Scorpio	Scorpion	Mummy	Scorpion	Scorpion
Sagittarius	Bowman	Arrows or Spears	Hunter and War God	Hunter and War God
Capricornus	Sea Goat	Beard	Bearded God	
Aquarius	Water Pourer	Water	Water	Water
Pisces	Fishes (and Knot)	Knot	Twisted Reeds	

Granting that these sequential analogies, if verified, establish intercontinental communication, we must now ask whether, if these concepts were brought into America from abroad, they seem to be associated with the earliest migration to this continent. We shall have to seek light on this point outside the field of astronomy. Professor Edward S. Morse and others have called attention to the significance of the facts that wheat was unknown in America at the time of its discovery by Columbus and that maize was then unknown outside of America; moreover, that there is little if any similarity between the more complex artifacts of America and of

other continents. It is practically certain that the cultivation of these cereals and the manufacture of the higher grades of artifacts must have preceded the creation of a zodiac, and its transmission around the world, and it is not reasonable to suppose that a migrating race having knowledge of either cereal or of artifacts would have carried with them the knowledge of the zodiac without that of their food and tools. The inference is obvious. The knowledge of the zodiac was not brought to or taken from America by the earliest inhabitants of another continent, but must have been transmitted in later times.

We must still explain how such knowledge could have been transmitted in later times without the cereals and artifacts. There seems to be but one consistent answer. The transmission was accomplished by accidental or sporadic communication with individuals of an alien race who were able to impart their mental concepts but who brought with them few or no material products. There was no general migration at this time. Let the reader suppose himself unexpectedly thrown by shipwreck among a people with whom his race has never before communicated. Grant him a few companions only, and imagine the result. How much of their civilization would they be able to impart? Probably only a few ideas. They had no cereals and their attempts to introduce their artifacts eventually failed to overcome the force of conservative habit and custom opposed to change. This is admittedly theoretical, but it seems to be the only theory which reconciles the otherwise inconsistent facts. But if this explanation is correct we see that even if the American Indian is a migrant from another continent astronomy cannot help us to say when or whence he came, because as soon as we find astronomical concepts of sufficient complexity to afford a possible means of tracing them back to an alien home they imply an advancement in culture inconsistent with the known characteristics of early American peoples, and therefore they cannot have come here with them. Astronomy reveals that there has been intercommunication with America in probably late prehistoric times, but it is silent as to what has taken place at an earlier stage.

## THE BEARING OF OCEAN CURRENTS ON THE PROBLEM

BY PAUL BARTSCH

I have been very much interested in all that has been said about the origin of the North American Indian, and particularly in the remarks of Mr Holmes, who showed that the archeological features on the American continent indicate a possible multiple contact, and there occurs to me a line of thought that seems, so far, not to have been expressed by any of the speakers, namely, the ocean highways along which primitive man or his handiwork may have reached our shores from other places. Most of the evidence brought forth in the meeting seems to call for a land bridge across Bering sea, which Dr Dall showed has not existed during the time that man is known to have been on the globe. There is, however, the strong North Pacific current, which sweeps the eastern shores of Asia and is deflected eastward so as to strike the American coast about Sitka, Alaska, where a part is deflected northward over the Aleutian islands, while another part turns south and sweeps the coast of Washington, Oregon, and California, before it is again deflected seaward.

Farther south we have the Equatorial counter-current, which sweeps most of the Pacific islands and finally touches our coast in the region of Guatemala, being deflected northward along the American shores into the Gulf of California. It is quite possible that the similarity in certain ethnologic features of the East Asiatic islands and Central America may be due to a common origin which may have been in the East Asiatic islands and may have come to our shores over this route.

The west coast of South America is swept by the Peruvian current, which comes from the south coast of Australia past New Zealand to our shores.

Looking at the great ocean currents of the Atlantic, we find that we have the North Equatorial current, which is in part a continuation of our Gulf Stream, flowing past the South European coasts over West Africa where it is deflected westward, to the American shores, which it strikes in the West Indian region, whence it is deflected northward as the Gulf Stream along our seaboard (at

some little distance off shore). After leaving our shores, off New Foundland, it touches the east coast of Iceland; then passes to Europe, where a part is deflected over the British Isles and the coast of Norway; while the rest turns southward as before stated.

In the South Atlantic we have what is known as the Benguela current which sweeps the southwest coast of Africa, striking the Gulf of Guinea, from which it is deflected westward to the American shores as the South Equatorial current. This stream, upon striking the eastern point of Brazil, splits, half being deflected southward as the Brazilian current over South America; the other half northward, where it mingles with the waters of the Equatorial current to form the Gulf Stream.

It would seem, therefore, that we might expect (even after America was peopled) to find northeast Asiatic cultural elements and even man drifting to our northwest shores; Polynesian and Melanesian to Central America; Australian and New Zealandic to the west coast of South America; Southwest African to South America and the West Indies, and even eastern North America; and South European and West African to the West Indies and eastern North America.

#### THE PROBLEM FROM THE STANDPOINT OF LINGUISTICS

BY ALEXANDER F. CHAMBERLAIN

The appearance of Part I of the *Handbook of American Indian Languages*,<sup>1</sup> edited by Dr Franz Boas and published by the Bureau of American Ethnology, containing, as it does, authoritative sketches of Athapascan (Hupa), Tlingit, Haida, Tsimshian, Kwakiutl, Chinook, Maidu, Algonquian (Fox), Siouan (Dakota), and Eskimo, by such approved investigators as Boas, Swanton, Goddard, Dixon, Thalbitzer, Jones, and Michelson, makes possible a new and saner method of comparative philology with regard to the numerous languages of the American Indians past and present. The illuminating Introduction to this volume, by Dr Boas, should be read by everyone who seeks either to know something about the Indian

<sup>1</sup> *Handbook of American Indian Languages*, by Franz Boas. Part I. (Smithson. Inst., Bur. Amer. Ethnol., Bull. 40.) Washington, 1911, pp. vi, 1069.

languages as such or to investigate the question of their possible relationship with forms of speech in other regions of the globe. What has been done here for North America will be done some time also for Central and South America, so that, before a student ventures to compare the languages of primitive America with those of Asia or elsewhere, he will know a large number of facts concerning their lexical, their morphological, their grammatical, and their syntactical characteristics and peculiarities, and so will be able to determine whether the resemblances observed are merely accidental, or justify the assumption of real linguistic kinship.

The older method of comparing indiscriminately and arbitrarily the vocabularies and word-lists alone of the mass of American Indian languages with those of the mass of Asiatic tongues is now hopelessly out of court for scientific purposes, though still to be met with in certain quarters, where "pseudo-ethnology" reigns supreme. The wholesale methods of a Professor Campbell, a Hyde Clarke, etc., have borne no legitimate fruit, and could bear none. Nor has anything really valuable or conclusive come from such speculations as those of Trombetti, Täuber, and others concerning the "original speech" of man, and its *disjecta membra*, which are now to be picked up here and there all over the world among the languages of all peoples, living and dead. In such studies, the facts concerning the individual development of a language here in America, its morphological and grammatical structure, as brought out by careful analysis and long-continued research, are ignored, or at least not made use of at all, and a few seeming word-identities permitted to settle a matter of fundamental significance in the history of human speech, or the development of the various types of human languages.

Another method, perhaps quite as old, was to select some one Asiatic and some one American Indian language, on the basis of a few alleged identities (again almost entirely of a lexical character, or embodied in a single morphological character, etc.), and prove that the New World tongue must necessarily have been derived from the Old World one. A familiar instance of this procedure is the comparison of the Mandan (a Siouan dialect) with Welsh, something that has not yet entirely disappeared from more or less

popular books about the Indian. It is to be found, too, in Catlin, who had not a little to say about the "Welsh Indians." Father Petitot saw Celtic elements in certain Algonquian dialects, and in 1883 read before the Association Française pour l'Avancement des Sciences a paper on the *Parallèle entre la famille caraïbo-esquimaude et les anciens Phéniciens*. Others have sought to connect the Caribs with the ancient Egyptians, etc. The Otomi language of Mexico was singled out for comparison with Chinese as early as 1835 by C. Náxera, whose Latin essay, *De Lingua Othomitorum Dissertatio*, was published at Philadelphia. Náxera has been followed by a number of ethnologists, including, as late as 1884, the French Americanist, Dr Hamy. The "isolating and monosyllabic character," ascribed to the Otomi, making it "stand separate and apart from all other American Indian languages," has been the basis of such conclusions. But Brinton in 1885, and others since, notably F. Belmar<sup>1</sup> in his discussion of the alleged monosyllabism of the Otomi family of speech, have destroyed the foundation for affiliation with Chinese. The Otomi and related tongues contain a majority of dissyllables, some monosyllables, and some polysyllables. The American character of these languages is fully established, and they cannot be derived from or affiliated directly or indirectly with Chinese.

The languages of the ancient Mexicans, Mayas, Peruvians, etc., probably on account of the fact that civilization was more highly developed among them than elsewhere in primitive America, have been often subject to comparison with Old World tongues, sometimes in ways even more unjustifiable than the attempt to parallel Otomi and Chinese. Mendoza<sup>2</sup> sought to prove that Nahuatl, the speech of the ancient Mexicans, was an Aryan language and a daughter of Sanskrit. Later, this theory of Aryan origin has been exploited by T. S. Denison, whose book<sup>3</sup> appeared in 1908; it treats of the

<sup>1</sup> Sistema silábico en las lenguas de la familia mixteco-zapoteca-otomí. *Anales del Museo Nac. de Arqueol.*, Mexico, tomo II, 1910-1911, pp. 261-271. See also H. de Charency in *Intern. Amer.-Kongr.*, 14te Tag., Stuttgart, 1904 [1906], p. 168.

<sup>2</sup> *Anales del Museo Nacional de México*, Tomo I.

<sup>3</sup> *The Primitive Aryans of America*, Chicago, 1908, pp. 189. See also this author's *Nauatl or Mexican in Aryan Phonology*, Chicago, 1907, pp. 24; and *A Mexican-Aryan Comparative Vocabulary*, Chicago, 1909, pp. 110.

origin of the Aztecs and kindred tribes, "showing their relationship to the Indo-Iranian and the place of the Nauatl or Mexican in the Aryan group of languages." The author does not hesitate to say that "the Mexican language is Aryan in vocabulary and in verb conjugation" (p. 9); "Mexican occupies an intermediate position between Sanskrit and Old Persian." Of course, no real evidence of such origin and relationship is forthcoming, although almost anything might be proved if one compares "calpolli, tribe, with cosmopolitan, its cognate," and treats "roots" after the fashion of Mr Denison. Needless to say, nothing concerning the origin of American Indian languages can be learned through such a method, which, unfortunately, will continue for some time to engage the attention even of men somewhat expert in linguistics, though not scientifically-minded enough to see the proper relation of things. Attempts to connect the Mayan tongues of Yucatan, Guatemala, etc., with languages of the Old World have failed even more conspicuously.

Paravey, in 1835, compared Chibchan, or Muyscan, of Colombia with Japanese, in a *Mémoire sur l'origine Japonaise, Arabe et Basque de la civilisation des peuples du plateau de Bogotá*, basing his work on the publications of Humboldt and Seybold, and reaching impossible conclusions.

The Quechua and Aymará languages of Peru and Bolivia, of all the South American linguistic stocks, have been most subject to theories of Old World derivation. Their supposed kinship has run all the way from Sumerian<sup>1</sup> to plain Aryan. E. Villamil de Rada, in his *La Lengua de Adán y el Hombre de Tiahuanaco* (La Paz, 1888, pp. 249), even argues that Aymará was the language of the Garden of Eden, another candidate for which ancient service is North American Algonquian, as maintained by A. Berloin in his *La Parole Humaine* (Paris, 1908).<sup>2</sup> V. F. Lopez's *Les races aryennes du Pérou* (Paris, 1871) and Ellis's *Peruvia Scythica* (London, 1875) have had their followers and imitators down to the present day. Others

<sup>1</sup> See S. A. Lafone-Quevedo, *Supuesta derivación sumero-asiria de las lenguas Kechua y Aymará*, Buenos Aires, 1911, pp. 11.

<sup>2</sup> See *American Anthropologist*, 1909, N. S., XI, pp. 123-124.

have sought to make out Semitic affinities with Quechua or Aymará or both. But all efforts to affiliate these South American tongues with Old World languages have had no scientific results, as might have been expected from the first.

The Polynesian-American comparison has been a favorite field for many linguistic explorers before and since the appearance of Lang's *Polynesian Origins* in 1860, where the *rapprochement* of vocabularies was made much of. The alleged Polynesian derivation of American Indian languages was discussed by the late Horatio Hale in a paper read before the Congrès International des Américanistes at Berlin, in 1888,<sup>1</sup> and the conclusion reached that "no traces of affiliation between the languages of America and those of Polynesia have thus far been discovered." It is certain also that none have been discovered since. Nevertheless, in a paper read before the Congrès International des Américanistes at Buenos Aires in 1910, Sr Anibal Echeverría i Reyes ventured the assertion that "the language of Easter Island has undoubted resemblances with the Cunza tongue, spoken in the desert of Atacama." But the *rapprochement* of the Polynesian dialect of Easter Island with Atacameñian has no more foundation than had that of Otomi with Chinese, Nahuatl with Sanskrit, or Quechua-Aymará with Aryan. It is rather surprising, however, to find an ethnologist like C. Hill-Tout<sup>2</sup> keeping to the old order of things and making, in the year 1911, a statement like the following: "Comparing the Salish language with such characteristic American tongues as the Algonquin or Déné, the affinities between these are infinitely less and more remote than those between Salish and the Oceanic tongues; and even if these resemblances should be shown to be fortuitous, and without real foundation, they are so remarkable that the classification of the Salish tongue would still be rather 'Oceanic' than 'American.'" Proof for such belief is lacking, and the Salishan can be safely assigned to the American Indian languages, like the Otomi, the Nahuatl, and others which various

<sup>1</sup> *Was America Peopled from Polynesia? A Study in Comparative Philology*, Berlin, 1890 (reprint), pp. 15.

<sup>2</sup> *J. Roy. Anthropol. Inst.*, Lond., 1911, vol. XLI, p. 134.

writers have sought to detach from the list of aboriginal linguistic stocks native to the New World.

Summing up the evidence on this question, it may be said with certainty, so far as all data hitherto presented are concerned, that no satisfactory proof whatever has been put forward to induce us to believe that any single American Indian tongue or any group of tongues has been derived from any Old World form of speech now existing or known to have existed in the past. In whatever way the multiplicity of American Indian languages and dialects may have arisen, one can be reasonably sure that the differentiation and divergence have developed here in America, and are in no sense due to the occasional intrusion of Old World tongues individually or *en masse*. It may be said here that the American languages are younger than the American Indians, and that, while the latter may have reached the New World in very remote times via Bering strait, the former show no evidence of either recent or remote Asiatic (still less European) *provenance*. There is thus absolutely no satisfactory evidence, from a linguistic standpoint, of the ultimate Asiatic derivation of the American aborigines; nor is there any of such a character as to argue seriously against such a view, which seems, on the whole, both reasonable and probable. Certain real relationships between the American Indians and the peoples of northeastern Asia, known as "Paleo-Asiatics," have, however, been revealed as a result of the extensive investigations of the Jesup North Pacific Expedition, which have been concerned with the somatology, ethnology, mythology, folk-lore, linguistics, etc., of the peoples on both sides of the Pacific, from Columbia river to Bering Strait and from the Amur to the extreme point of northeastern Asia. The monographs containing the scientific results of the Jesup Expedition are still in course of publication. The ones most significant for American-Asiatic relations are those of Sternberg on the tribes of the Amur, Jochelson on the Koryak and the Yukaghirs, and Bogoras on the Chukchee and the Siberian Eskimo. The general conclusion to be drawn from the evidence disclosed by the Jesup Expedition is that the so-called "Paleo-Asiatic" peoples of northeastern Asia, *i. e.*, the Chukchee, Koryak, Kamchadale,

Gilyak, Yukaghir, etc., really belong physically and culturally with the aborigines of northwestern America; and they probably reached the parts of Asia they now inhabit (or once inhabited, for some of them had formerly a larger area of distribution) from America at a time more recent than the original peopling of the New World from Asia by way of Bering strait. Like the modern Asiatic Eskimo, they represent a reflux from America to Asia and not *vice versa*. In brief, these peoples may be said to be "modified Americans." It is the opinion of good authorities also that the "Paleo-Asiatic" peoples belong linguistically with the American Indians rather than with the other tribes and stocks of northern or southern Asia.<sup>1</sup> Here we have, then, the only real relationship of a linguistic character that has ever been convincingly argued between tongues of the New World and tongues of the Old. The special resemblances of the Gilyak with the American Indian languages, from a morphological point of view, has been treated by Sternberg, in a paper read before the Congrès International des Américanistes at Stuttgart in 1904.<sup>2</sup> In his sketch of the grammar of the Yukaghir, Jochelson<sup>3</sup> points out a number of respects in which that language also resembles the American Indian rather than the Ural-Altaic tongues of the Asiatic continent. And finally, Dr Franz Boas, in his article on "Ethnological Problems in Canada,"<sup>4</sup> makes this statement: "A consideration of the distribution, and the characteristics of languages and human types in America and Asia, have led me to formulate the theory that the so-called Paleo-Asiatic tribes of Siberia must be considered as an offshoot of the American race, which may have migrated back to the Old World after the retreat of the Arctic glaciers."

The verdict of linguistics on the question of the origin of

<sup>1</sup> See F. Boas, Ethnological Problems in Canada, *J. Roy. Anthr. Inst.*, Lond., 1910, vol. XL, pp. 529-539. Also his other discussions of the results of the Jesup Expedition.

<sup>2</sup> Bemerkungen über Beziehungen zwischen der Morphologie der gilyakischen und amerikanischen Sprachen. *Intern. Amerik.-Kongr. Vierzehnte Tagung*. Stuttgart, 1904. (Stuttgart, 1906), pp. 137-140.

<sup>3</sup> Essay on the Grammar of the Yukaghir Language, *Ann. N. Y. Acad. Sci.*, 1905, vol. XVI, pt. II, pp. 97-154. See pp. 138-140.

<sup>4</sup> *J. Roy. Anthr. Inst.*, 1911, vol. XL, p. 534.

the American Indians is, therefore, that the cause of the multiplicity of stocks and languages present in the New World must be sought in the New World itself, and not by a theory of intermixture with Asiatic tribes or peoples derived from any other quarter of the globe since the permanent settlement of the land by the early ancestors of the Indians, who themselves reached America from the Old World, probably via Bering strait (though, linguistically, there is no final argument barring the peopling of America from ancient Europe), at a rather remote period. The American languages, as has already been noted, are younger than the American Indians, and have evolved in the New World without any relationship with the tongues of the Old World being probable or even possible (the peopling of Polynesia, *e. g.*, occurred too late to have influenced the linguistics of primitive America). The only proved connections between the Old World and the New World in the matter of languages are the American-Asiatic relationships demonstrated to have existed in northwestern North America and northeastern Asia. Here the net result seems to be that we must include the "Paleo-Asiatic" peoples and their languages as "American", or at least "Americanoid". Their emigration from America into Asia is, however, recent as compared with the original advent of man in the New World.

#### MYTHOLOGY

By ROLAND B. DIXON

In any consideration of the question of the evidence afforded by mythology in respect to the "unity and probable place of origin of the American Indian," it is necessary to distinguish carefully between race and culture. If by race we are to understand a group based on physical characteristics and descent, then mythology is a most uncertain reed upon which to lean, for, as is now generally recognized, physical type and culture are in no way necessarily related. Mythology can thus by itself afford little evidence in regard to the racial unity or origin of the American Indian. If, on the other hand, it be a question of culture, mythology can and doubtless will supply evidence of great value in tracing the cultural

origins of the peoples of America. At the present time, however, the available material for a thorough study of American mythology leaves much to be desired. For considerable portions of North America, to be sure, the collections of myths are fairly full and representative, but there still remain large areas, particularly in Mexico and in the north, in regard to which the information is very scanty. For South America it may be said that hardly a beginning has been made, and for a large part of the continent no material at all is available.

On the basis of the evidence at hand, however, tentative conclusions may be drawn. Considered in some detail as to subject matter, the mythology north of Mexico shows that a number of areas may be distinguished within each of which a more or less distinctive group of myths is found. These areas coincide roughly, as might indeed be expected, with the main general culture areas, such as the Northwest Coast, the Plains, the Southwest, etc. The limits of these myth areas, however, are generally much less clearly marked than in the case of the general culture areas, and very commonly certain myths or myth-incidents have a distribution far wider, some extending, indeed, almost from ocean to ocean, or from the Arctic to the Gulf. In many cases the distribution of the myth-incidents can be shown to have followed trade or migration lines, and their wide dispersal can in this way be accounted for.

If, instead of considering the substance of the myths, their general character is taken as the basis, a much wider grouping appears, and such contrasts as that between the Eskimo (with their matter-of-factness and paucity of animal tales) and the great bulk of all the tribes to the southward become apparent. Similar more general groups are such as those possessing or not possessing the migration type of myth, or those in which the distinction between the mythical age and that which follows is or is not sharply marked, etc. In such a more general aspect, the mythology of Mexico and Central America is contrasted with that to the north, owing to the prevalence in the former region of Messiah-like myths—a type that extends, indeed, farther south along the western shore of South America.

Even from this wider point of view, then, it would appear that there are several more or less well-marked types of mythology occurring in America. In spite of these distinctions, however, there is nevertheless a certain similarity in character that runs through them all, such that they may be said, for instance as compared with African mythology, to present a general unity. Indeed, in the more detailed consideration of the substance of the myths themselves, it appears that some few incidents are to be found which are common both to South and North America. So far, then, as the present material goes, a general similarity in type may be said to exist in American mythology, although within this broad uniformity a number of contrasted groups appear.

In its relations to the mythologies of other areas, the most important associations are to be found with northeastern Asia. Here the degree of similarity is most striking, the myths of northeastern Asia and of northwestern America forming practically one great group, the members of which are allied not by form alone, but by actual content of the myths themselves. Except for this area, no clear evidence of relationship has been shown.

This Asiatic relationship must not, however, be regarded as furnishing evidence relating to the origin of the American Indian. It indicates a cultural relationship only, and far from pointing to an Asiatic source for the culture even, the bulk of the evidence would favor the theory that the similarity shown in the mythologies is the result of influences passing from America to Asia, and not in the reverse direction. Such cultural influence, moreover, belongs to a stage in culture far above that which must have been possessed by the ancestors of the present Indian at the time when they first came to America and belongs to a period far more recent than that at which the peopling of the American continent must have taken place.